

WHAT WE CLAIM IS:

1. An image pickup system comprising an image-formation optical system for forming an image of a subject and an electronic image pickup device located on an image side of said image-formation optical system for obtaining image information on said image, wherein:

an angle between the farthest-off-axis chief ray incident on the farthest off-axis site on an image pickup plane of said electronic image pickup device and an axial chief ray incident on the center of said image pickup plane satisfies the following conditions (1) and (2), and said image pickup device satisfies the following condition (3):

$$\begin{aligned} 36^\circ < \omega_{w1} < 60^\circ & \dots (1) \\ -15^\circ \leq \omega_{w0} < 10^\circ & \dots (2) \\ 3.5 < N < 20 \text{ (in million)} & \dots (3) \end{aligned}$$

where  $\omega_{w1}$  is an angle between a direction of incidence of said axial chief ray and a direction of incidence of said farthest-off-axis chief ray on an entrance plane of said image-formation optical system or, alternatively, at a wide-angle end when said image-formation optical system is a zoom optical system,  $\omega_{w0}$  is a angle between a direction of emergence of said axial chief ray and a direction of emergence of said farthest-off-axis chief ray on an exit plane of said image-formation optical system or, alternatively, at a wide-angle end when said image-formation optical system is a zoom optical system with the proviso that a sign for the direction of emergence of light away from an optical axis thereof is negative, and N is an effective number of pixels of said electronic image pickup device (in million) or a maximum number of

recording pixels by signal processing (in million).

2. An image pickup system according to claim 1, wherein said image-formation optical system satisfies the following condition (4):

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$$28^{\circ} < \omega_{w1} + \omega_{w0} < 45^{\circ} \quad \cdot \cdot \cdot (4)$$

3. An image pickup system according to claim 1 or 2, wherein an image pickup plane of said electronic image pickup device has a diagonal length D capable of meeting the following condition (5):

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$$5 \text{ mm} < D < 30 \text{ mm} \quad \cdot \cdot \cdot (5)$$

4. An image pickup system according to claim 1 or 2, wherein said image-formation optical system has an image-formation capability that satisfies the following condition (6), and said electronic image pickup device satisfies the following condition (7):

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$$1.05 < \phi_w / P \times \sqrt{(3.5/N)} < 8/0 \quad \cdot \cdot \cdot (6)$$

$$0.0015 < P < 0.008 \text{ (mm)} \quad \cdot \cdot \cdot (7)$$

where  $\phi_w$  is a diameter in mm of a 90% encircled energy of a point spread function by amplitude by an optical system at an f number of F5.6 at substantially the center of an image plane and a wavelength e-line, from which a low-pass action due to an optical low-pass filter is eliminated or, alternatively, a diameter of the 90% encircled energy at an wide-angle end in the case where said image-formation optical system is a zoom optical system, and P is a pixel pitch in mm of the image pickup device.

5. An image pickup system according to claim 1 or 2, wherein said image-formation optical system is a zoom lens including a wide-angle end, in which a half angle of view with respect to a subject on an infinite object point is  $36^{\circ}$  or greater.

6. An image pickup system according to claim 1 or 2, wherein said image-formation optical system is of image-formation capability satisfying the following condition (8):

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$$1.5 < \phi_w / P < 8.0 \quad \dots (8)$$

where  $\phi_w$  is a diameter in mm of a 90% encircled energy of a point spread function by amplitude by an optical system at an f number of F5.6 at substantially the center of an image plane and a wavelength e-line, from which a low-pass  
10 action due to an optical low-pass filter is eliminated or, alternatively, a diameter of the 90% encircled energy at a wide-angle end in the case where said image-formation optical system is a zoom optical system, and P is a pixel pitch in mm of the image pickup device.

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